Space Weather Forecast

Issued on Wednesday 6 November 2024 at 01:14 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High solar activity with further Moderate flares expected, and a slight chance of Strong flares. Chance of G1/Minor Storms on 06/07 Oct.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with a moderate-class flare from an Ex-sunspot region, which is just beyond the west limb.

There are eleven active sunspot regions on the visible disc. The two most actively flaring regions on the disc, are located in the southeast, both underwent some slow growth and have moderate magnetic complexity. A previously active flaring region in the northwest continued to decay. The remaining spots on the disc are comparatively smaller or less magnetically complex. New minor spots emerged in the southeast and northwest disc, meanwhile at least one region rotated off the facing-disc.

A Coronal Mass Ejection (CME) was observed near the east limb in association with a Moderate-class flare from a sunspot region in the southeast. on 04 Nov. Although the bulk of the ejecta appears to pass behind Earth's orbit, a faint partial halo of material (mainly shock) appears to pass the Earth-Sun line, meaning that there is an chance of a glancing impact from this feature either late 06 Nov or on 07 Nov. This event that currently carries low-moderate confidence.

Solar Wind / Geomagnetic Activity: Solar winds were at Slightly Elevated levels throughout, generally between 420-470km/s due to minor coronal hole influence. The Interplanetary Magnetic Field (IMF), Bt, was predominantly Weak to Moderate. The north-south component, Bz, varied weakly, oscillating between positive and negative directions. Geomagnetic Activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) fell to background levels through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High activity is forecast to continue with occasional Moderate flares expected and a slight chance of isolated Strong flares. These most likely from the large region in the northwest, or the two moderately sized regions in the southeast disc.

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Solar Wind / Geomagnetic Activity: Connection to coronal hole fast winds is ongoing, albeit weakly, with a steady decline likely on Day 1 (06 Nov). A further minor HSS enhancement is possible late Day 3 (08 Nov) into Day 4 (09 Nov).

A CME that left the Sun early on 04 Nov has been re-analysed, which may give Earth a glancing impact either on Day 1 or 2 (06 or 07 Nov) with low-moderate confidence.

Geomagnetic activity is expected to decline to mainly Quiet levels through Day 1 (06 Nov) and Day 2 (07 Nov), potentially becoming Unsettled to Active with a chance of G1/Minor Storm intervals depending on any potential CME influence. On Day 3 and 3 (08-09 Nov) activity should be Quiet to Unsettled, but with a chance of isolated Active intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) has now declined to background levels, with only a slight chance of further enhancement above S1/Minor Storm levels.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	30	30	10	10
Strong	**G3**	No	1	1	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	Yes	80	80	80	80
Very Active	**R3-R5 (X Class)**	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	10	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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